Improving Quality Measurement using Multiple Data Sources

Kenneth W. Scully, MS, Jason A. Lyman, MD, George J. Stukenborg, PhD
Department of Health Evaluation Sciences
University of Virginia Health System, Charlottesville, VA

ABSTRACT

We calculated a sample of AHRQ Quality and Patient Safety Indicators for UVa hospitalized patients over a 3 year period using diagnoses and procedure codes from two different billing systems. Significant differences in results were observed suggesting that quality indicators calculated from hospital billing sources alone may be understated.

INTRODUCTION

Accurate reporting of quality of care depends on the completeness of the data used in the measurement. The Quality and Patient Safety Indicators developed by the Agency for Healthcare Research and Quality (AHRQ)[1] rely heavily on diagnosis and procedure codes contained within hospital billing systems. At the University of Virginia (UVa) Health System, professional medical coders feed the hospital billing system with diagnosis and procedure codes by abstracting the patient chart after discharge.

Physician billing systems represent another potential source of the same information. For hospitalized patients, physicians record relevant diagnoses and procedures on a daily basis, often during morning rounds.

The utility of the AHRQ Quality Indicators depends, in large part, upon their accuracy. We compared results for these indicators using both hospital and physician coded data to explore the level of agreement. Disagreement between these sources might be due to several factors, but might also indicate the added value of another information source for measuring quality.

METHODS

The Clinical Data Repository (CDR)[2] is a UVa patient data warehouse, which receives data from both the hospital and physician billing systems and loads them into an integrated database. Using 3 years of inpatient data from the CDR (2000 – 2002) we calculated several of the AHRQ quality indicators using data from each source.

We limited our comparison to a sample of Patient Safety Indicators measuring complication rates anticipating that physicians, while treating immediate day-to-day problems, may be more likely to encode diagnoses affecting these indicators. We calculated the quality indicators for each data source separately, but also looked at the overlap and the union of the combined sources.
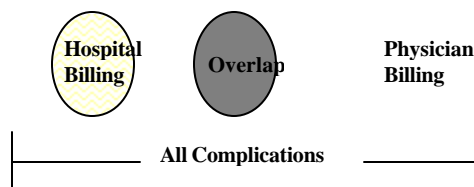
RESULTS

Table 1 shows results for the sample of Patient Safety Indicators.

One difficulty is that procedure codes in the physician billing system use CPT codes while the hospital billing system uses ICD9 codes. Since some indicators are defined using ICD9 procedure codes these must be mapped to equivalent CPT codes. Unfortunately, this mapping is sometimes ambiguous.

CONCLUSION

In spite of this, the results suggest a large discrepancy between hospital billing and the physician billing sources for a sample of the AHRQ Quality and Patient Safety Indicators. While the physician billing codings need to be validated, it appears that using hospital billing sources alone may result in under–reporting of complications and give a better picture of quality than really exists.

References

[1] *AHRQ Quality Indicators*. Oct, 2002. Agency for Healthcare Research and Quality, Rockville, MD. http://www.qualityindicators.ahrq.gov/data/hcup/inpatqi.htm.
[2] cully, Pates, et al. Development of an Enterprise-Wide Clinical Data Repository: Merging Multiple Legacy Databases. *AMIA Annual Fall Symposium*, 1997:32-36.

Quality Indicator	#Visits	# Complications				Rate per 100 patients				% Chg
		Hosp	Phys	Overlap	Union	Hosp	Phys	Overlap	Union	
Post-op DVT/PE	21646	252	403	135	520	1.16	1.86	0.62	2.40	206.3
Post-op Hemorrhage or hematoma	24047	88	75	53	110	0.37	0.31	0.22	0.46	125.0
Infection due to medical care	66022	286	92	36	342	0.43	0.14	0.05	0.52	119.6
Technical difficulty with procedure	64349	458	53	34	477	0.71	0.08	0.05	0.74	104.1
Obstetric trauma - cesarean section	916	20	13	5	28	2.18	1.42	0.55	3.06	140.0

Table 1. Number of complications from hospital billing, physician billing, the overlap and the union of both. The % change compares the rate using hospital billing source only vs. using both sources.